

CLAIMS

What is claimed is:

- 1           1.       A PCI-X DDR driver for providing internal termination to a transmission  
2 line, comprising:  
3           a driver control;  
4           a plurality of N-channel devices, the plurality of N-channel devices being divided  
5           into at least two groups; and  
6           a plurality of P-channel devices, the plurality of P-channel devices being divided  
7           into at least two groups,  
8           wherein the driver control is suitable for individually controlling selected ones of  
9           the groups of N-channel and P-channel devices on or off for providing  
10          internal termination to the transmission line.
- 1           2.       The PCI-X DDR driver as claimed in claim 1, wherein the driver control  
2 controls selected ones of the groups of N-channel and P-channel devices on or off for  
3 providing one of pull-up type termination, pull-down type termination, and symmetric  
4 type termination to the transmission line.
- 1           3.       The PCI-X DDR driver as claimed in claim 2, wherein the driver control  
2 enables selected ones of the groups of P-channel devices for providing pull-up  
3 termination.
- 1           4.       The PCI-X DDR driver as claimed in claim 3, wherein the transmission  
2 line includes a transmission line end having a terminator impedance, and wherein the  
3 terminator impedance is connected to a power supply VDD.
- 1           5.       The PCI-X DDR driver as claimed in claim 2, wherein the driver control

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2 enables selected ones of the groups of N-channel devices for providing pull-down  
3 termination.

1 6. The PCI-X DDR driver as claimed in claim 5, wherein the transmission  
2 line includes a transmission line end having a terminator impedance and wherein the  
3 terminator impedance is connected to a system ground VSS.

1 7. The PCI-X DDR driver as claimed in claim 2, wherein the driver control  
2 enables selected ones of the groups of both P-channel and N-channel devices for  
3 providing symmetric termination.

1 8. The PCI-X DDR driver as claimed in claim 7, wherein the transmission  
2 line includes a transmission line end having a terminator impedance and wherein the  
3 terminator impedance is connected to both a power supply VDD and a system ground  
4 VSS.

1 9. The PCI-X DDR driver as claimed in claim 1, wherein the driver control  
2 includes an impedance controller for correcting process/voltage/temperature effects.

1 10. The PCI-X DDR driver as claimed in claim 1, wherein a size of at least  
2 one of the groups of N-channel and P-channel devices has its size weighted to provide an  
3 output impedance for given process/voltage/temperate conditions

1 11. The PCI-X DDR driver as claimed in claim 10, wherein the size of at least  
2 one of the groups of N-channel and P-channel devices has its size weighted in  
3 conjunction with a discrete resistor.

1           12.    A PCI-X DDR system, comprising:  
2    a transmission line; and  
3    driver for providing internal termination to the transmission line, the driver including:  
4       a driver control;  
5       a plurality of N-channel devices, the plurality of N-channel devices being divided  
6           into at least two groups; and  
7       a plurality of P-channel devices, the plurality of P-channel devices being divided  
8           into at least two groups,  
9       wherein the driver control is suitable for individually controlling selected ones of  
10           the groups of N-channel and P-channel devices on or off for providing  
11           internal termination to the transmission line.

1           13.    The PCI-X DDR system as claimed in claim 12, wherein the driver control  
2    controls selected ones of the groups of N-channel and P-channel devices on or off for  
3    providing one of pull-up type termination, pull-down type termination, and symmetric  
4    type termination to the transmission line.

1           14.    The PCI-X DDR system as claimed in claim 13, wherein the driver control  
2    enables selected ones of the groups of P-channel devices for providing pull-up  
3    termination.

1           15.    The PCI-X DDR system as claimed in claim 14, wherein the transmission  
2    line includes a transmission line end having a terminator impedance, and wherein the  
3    terminator impedance is connected to a power supply VDD.

1           16.    The PCI-X DDR system as claimed in claim 13, wherein the driver control  
2    enables selected ones of the groups of N-channel devices for providing pull-down  
3    termination.

1           17.     The PCI-X DDR system as claimed in claim 16, wherein the transmission  
2 line includes a transmission line end having a terminator impedance and wherein the  
3 terminator impedance is connected to a system ground VSS.

1           18.     The PCI-X DDR system as claimed in claim 13, wherein the driver control  
2 enables selected ones of the groups of both P-channel and N-channel devices for  
3 providing symmetric termination.

1           19.     The PCI-X DDR system as claimed in claim 18, wherein the transmission  
2 line includes a transmission line end having a terminator impedance and wherein the  
3 terminator impedance is connected to both a power supply VDD and a system ground  
4 VSS.

1           20.     The PCI-X DDR system as claimed in claim 12, wherein the driver control  
2 includes an impedance controller for correcting process/voltage/temperature effects.

1           21.     The PCI-X DDR system as claimed in claim 12, wherein a size of at least  
2 one of the groups of N-channel and P-channel devices has its size weighted to provide an  
3 output impedance for given process/voltage/temperate conditions

1           22.     The PCI-X DDR system as claimed in claim 21, wherein the size of at  
2 least one of the groups of N-channel and P-channel devices has its size weighted in  
3 conjunction with a discrete resistor.

- 1           23.     A PCI-X DDR driver for providing internal termination to a transmission  
2 line, comprising:  
3           a plurality of N-channel devices, the plurality of N-channel devices being divided  
4           into at least two groups;  
5           a plurality of P-channel devices, the plurality of P-channel devices being divided  
6           into at least two groups;  
7           means for individually controlling the groups of N-channel and P-channel  
8           devices;  
9           wherein the controlling means is suitable for individually controlling selected  
10           ones of the groups of N-channel and P-channel devices on or off for  
11           providing internal termination to the transmission line.